

REMARKS/ARGUMENTS

Claims 1-36 were pending of which claims 1-22 were withdrawn and claims 23-36 were rejected. Claims 1-22 have been cancelled, claims 23-24, 28-29, 31, 33, and 36 have been amended. Applicant requests reconsideration.

Claim Rejections – 35 U.S.C. §102

Claims 23, 24, and 33 were rejected under 35 U.S.C. §102(e) as being anticipated by Nikoonahad et al. (7,009,704) ("Nikoonahad"). Claims 33 and 34 were rejected under 35 U.S.C. §102(e) as being anticipated by Raymond (6,856,408) ("Raymond"). Claims 23-33, 35, and 36 were rejected under 35 U.S.C. §102(e) as being anticipated by Mieher et al. (2004/0169861) ("Mieher"). Claims 23 and 24 were rejected under 35 U.S.C. §102(e) as being anticipated by Stirton (6,458,605) ("Stirton"). Reconsideration is respectfully requested.

Independent claims 23 and 33 have been amended to recite "correcting the determined overlay error for effects of local process variations created during processing of the overlay pattern using the detected radiation from at least one pair of the measurement locations from the overlay pattern." Applicant submits that the amendment merely makes explicit what was always implicit in the claim and therefore does not narrow the claim nor does it add new matter.

As is well known in the art, the determination of overlay error is a measurement of the misalignment between two layers. As is also well known in the art, and described, e.g., at page 2, lines 13-20 of the present application, "local process variations" are not a misalignment between layers, but a localized variation, such as a difference in film thickness, grating height or grating linewidth, that can be caused processing, such as chemical mechanical polishing. Local process variations can result in a measured overlay error, even if there is no misalignment between the layers. Thus, Applicant submits that it is clear that the originally recited "correcting the overlay error for local process variations" is the same as "correcting the determined overlay error for local process variations".

That being said, the recitation in independent claims 23 and 33 of "correcting the determined overlay error for effects of local process variations" is directed to correcting the determined overlay error. The cited Nikoonahad, Raymond, and Stirton references, on the other hand, are directed at correcting the misalignment between layers using the measured

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overlay error. This is an important distinction. Nikoonahad, Raymond and Stirton relate to using the overlay measurement to improve the alignment between the layers. Claims 23 and 33, however, are related to generating an overlay error measurement that is corrected for local process variations.

Specifically, col. 15, line 66 to col. 16, line 3 of Nikoonahad states "The overlay error value(s) measured prior to the etching process using any one or more of the above-described techniques may be supplied to the etcher for altering any one of the etching parameters in order to correct any errors that have been found using the systems." Col. 11, line 21 to 30 of Raymond states "The alignment of two successive layers on a semiconductor wafer is critical for the ultimate performance of the devices being manufactured. This alignment (also called overlay) is so important that there are tools dedicated to performing this one task. These tools are based on measuring images of special alignment marks printed at each layer. As the semiconductor industry moves towards smaller and smaller dimensions, however, there is a great deal of doubt surrounding the ability of these tools to provide the necessary measurement resolution." Stirton recites at col. 4, lines 2-4 "The present invention provides a method of implementing automated error correction for control of overlay error" Thus, these references disclose correcting for misalignment using a processing tool based on the measured overlay error, not "correcting the determined overlay error for effects of local process variations" as recited in claims 23 and 33.

As for Mieher, Mieher discloses improving the overlay error measurement by correcting for errors introduced by the manner in which the overlay error is determined. The last sentence of paragraph [0070] of Mieher states "This property P3 may be analyzed in connection with the difference spectra properties P1 and P2 to refine the determination of the overlay E to include non-linear corrections or measurements of the errors introduced by using a linear approximation." Thus, Mieher recognizes an error introduced into the overlay measurement, which is caused by determining the overlay error E "by performing a linear approximation with the two obtained difference spectra properties P1 and P2." See, paragraph [0067]. To remedy errors caused by the linear approximation, Mieher proposes that "additional targets may be produced on the sample to improve the accuracy of the overlay measurements." Paragraph [0070].

In other words, Mieher recognizes an error in the calculation of the overlay error caused by using a linear approximation, and proposes a solution of using additional targets. Local process variations, on the other hand, are "created during processing of the overlay

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pattern" and are not an error in the manner that the overlay error is determined. Accordingly, Mieher, however, does not disclose or suggest "correcting the determined overlay error for effects of local process variations" as recited in claims 23 and 33.

Thus, Applicants respectfully submit that claims 23 and 33 are patentable over Nikoonahad, Raymond, Mieher and Stirton. Reconsideration and withdrawal of this rejection is respectfully requested. Claims 24-32 depend from claim 23 and claims 34-36 depend from claim 33, and are, therefore, likewise patentable for at least the same reasons.

Claims 23-24, 28-29, 31, 33, and 36 have been amended and claims 1-22 have been cancelled leaving claims 23-26 pending. For the above reasons, Applicants respectfully request allowance of all pending claims. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 378-7777 ext 112.

CERTIFICATE OF FACSIMILE TRANSMISSION

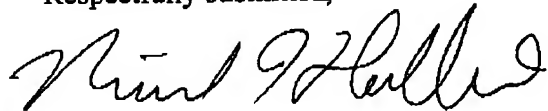
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